

## M-DIVIDER MATERIAL-BAY RESTRAINING CABLE SYSTEM

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### BACKGROUND OF THE INVENTION

#### Field of the Invention

10       The present invention relates to material-rack safety systems, and more particularly to easy-to-disconnect restraining cables that restrain vertical stands of board and stick materials in divided display racks.

#### Description of Related Art

15       A typical warehouse retail store, e.g., The Home Depot, has divided racks for displaying wood moldings, corrugated roofing, and dimensional lumber. The material is stood on-end, and tilted-in to stay put. But very little keeps the  
20       long pieces in place in their divided racks. Not stacking the material right, bumping it, or an earthquake could result in a lot of heavy, dangerous material raining down on customers and workers.

25       So a number of devices have been developed in the prior art to keep such material in their divided racks. Those devices that are too difficult to be installed, don't get installed. Those that are too difficult to secure, don't get secured. And those mechanisms that are too difficult to  
30       disconnect or open can impede sales, or make the customer seek store-employee help. All of these things can work against the retail sales concept of self-help customers in warehouse stores.

      A latched beam-to-column storage rack connector is described by Charles Highsmith, et al., in United States

Patent 5,624,045, issued April 29, 1997. Here an improved hook-and-peg arrangement is disclosed. The problem of bumping the retaining bar up and unlatching it inadvertently was recognized. The configuration described supposedly  
5 overcomes such troubles.

A warehouse material-bay restraining cable system is described by the present inventor, Michael J. Calleja, in United States Patent 6,672,546, issued January 6, 2004. Such describes restraining cables that are attached at fixed  
10 points to bay dividers. It would be advantageous for the users to be able to freely and easily adjust the height of the restraining cables.

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#### SUMMARY OF THE INVENTION

Briefly, a restraining cable and rack system embodiment  
20 of the present invention comprises tubular material-bay dividers with wire-rope restraining cable gates and easy-to-release cable clips that can be adjusted to various heights in the bays. Long sticks or sheets of material are stood on-end inside the bays for retail display. The cable clips  
25 are mounted on the front edges of the tubular material-bay dividers and the wire-rope restraining cable gates are secured to prevent the retail material from falling out onto the aisleways. A sliding lock on the cable clips has an enlarged hole that can be aligned to allow a beaded end of  
30 the wire-rope restraining cable gates to be secured or released. Such sliding lock is loosely attached, and will fall into a cable-locked position when not held up.

An advantage of the present invention is that a safety restraint is provided that is easy and simple to use.

A further advantage of the present invention is that a material display bay safety restraint is provided that is easy and simple to adjust.

Another advantage of the present invention is that a  
5 restraining cable and rack system is provided for retail home-improvement warehouse use.

A further advantage of the present invention is that a restraining cable system is provided that cannot be bumped or jarred into releasing the restraint gates.

10 The above and still further objects, features, and advantages of the present invention will become apparent upon consideration of the following detailed description of specific embodiments thereof, especially when taken in conjunction with the accompanying drawings.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

20 Fig. 1 is a perspective view of a restraining cable and rack system embodiment of the present invention;

Fig. 2 is a perspective view of the material bay dividers and cable-height adjustment bars used in the system of Fig. 1;

25 Fig. 3 is a perspective view detailing a vertical cable adjustment bar and its attachment to a lobe of an upper part of a material bay divider, as used in Figs. 1 and 2;

Fig. 4 is a perspective view detailing the snap hook attachment of a restraining cable to a cable-height  
30 adjustment bar, as used in Figs. 1-3;

Fig. 5 details a vertical cable restraint anchor bar, as used in Figs. 1-3, for the intermediate dividers; and

Fig. 6 is a perspective view of a material-storage system that is an alternative embodiment of the present invention.

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#### DETAILED DESCRIPTION OF THE INVENTION

10        Fig. 1 illustrates a restraining cable and rack system embodiment of the present invention, referred to herein by the reference numeral 100. The implementation shown here has four bays for vertically standing long boards or material sheets in retail displays in home-improvement  
15        warehouse stores, etc. For example, dimensional 2-by-4 lumber studs 101-103. Any number of bays can be used.

         The restraining cable and rack system 100 comprises side frames 104 and 106 between which are hung lateral beams 108-110. Beams anchors 112-114 are laterally adjusted and  
20        bolted down to fix the widths of each bay formed by adjacent dividers. A pair of dividers 116 and 118 form an "M" and are bridged at their respective frontal lobes by a vertical cable adjustment bar 120. Such dividers 116 and 118 can be made of tubular aluminum, or other similar bars and pipes of  
25        structural materials. This is typical for all five such dividers shown in Fig. 1 that make the four bays shown. One or more restraining cables 122 and 123 can be attached at a variety of heights on the vertical cable adjustment bar 120. Such cables can be wire-rope, such as braided stainless  
30        steel, or may be of strong plastic like nylon. The cables 121-123 shown in Fig. 1 bridge the bays and attach to respective vertical cable adjustment bars 120. However, shorter cables can be used instead to bridge across fewer such bays, e.g., cable 121.

The second through fifth M-divider assemblies are numbered 124-127 in Fig. 1. These form four bays A-D.

Fig. 2 represents a material display divider system 200 with M-dividers and cable-height adjustment bars as used in the system of Fig. 1. A complete "M-divider" includes an upper divider 201 and a lower divider 202 which are attached to beam anchors 204-206. These are respectively clamped onto lateral beams 208-210. A vertical bar 212 bridges the frontal lobes of the dividers 201 and 202. Such has a number of slots and holes in which a restraint cable can be threaded or connected. For example, as shown in Figs. 4-5.

Similarly, a second M-divider comprises an upper divider 214 and a lower divider 215 which are attached to beam anchors 216-218. These are also respectively clamped onto lateral beams 208-210. A second vertical bar 220 bridges the frontal lobes of the dividers 214 and 215.

Fig. 3 details a vertical cable restraint anchor bar 300, as used in Figs. 1-2. The vertical cable restraint anchor bar 300 includes a flat metal body 302 folded into a U-channel to capture the tubing of an M-divider 304. A carriage bolt 306 and machine nut 308, or other type of fastener, is used to secure and fasten the assembly. The body 302 is punched or drilled with slots 310-311 and holes 312-313. If carriage bolts are to be used, such holes can be square, as shown in the drawings. The intended use of such slots and holes is more apparent in Fig. 4.

Fig. 4 details a vertical cable restraint anchor bar 400, as used in Figs. 1-3 at each side end. The vertical cable restraint anchor bar 300 includes a structural body 402 that is punched or drilled with slots 404-407 and holes 408-410. These allow a snap-hook 412 attached to the end of a restraining cable 414 to be attached by a user at a variety of vertical positions or heights.

Fig. 5 details a vertical cable restraint anchor bar 500, as used in Figs. 1-3 for the intermediate dividers. The vertical cable restraint anchor bar 500 includes a structural body 502 that is punched or drilled with slots 504-507 and holes 508-510. These allow a snap hook 412 and a restraining cable 512 to be passed through by a user at a variety of vertical positions or heights. For example, a slot 1.5" by three-eighths to one inch wide has proven useful.

Fig. 6 represents a material-storage system 600 that is an alternative style to that shown in Fig. 1. Here, a cantilever backing frame 602 is fitted with lateral beams 604-606. This allows a set of M-dividers 608-612 to be attached and adjusted to suit the material being displayed. Here, four bays are formed by the five M-divider 608-612. The material on display rests on a floor plank 614. Different restraint cables 616-618 are laced and attached at corresponding strategic points along the vertical bars at the front of each M-divider 608-612.

Although particular embodiments of the present invention have been described and illustrated, such is not intended to limit the invention. Modifications and changes will no doubt become apparent to those skilled in the art, and it is intended that the invention only be limited by the scope of the appended claims.